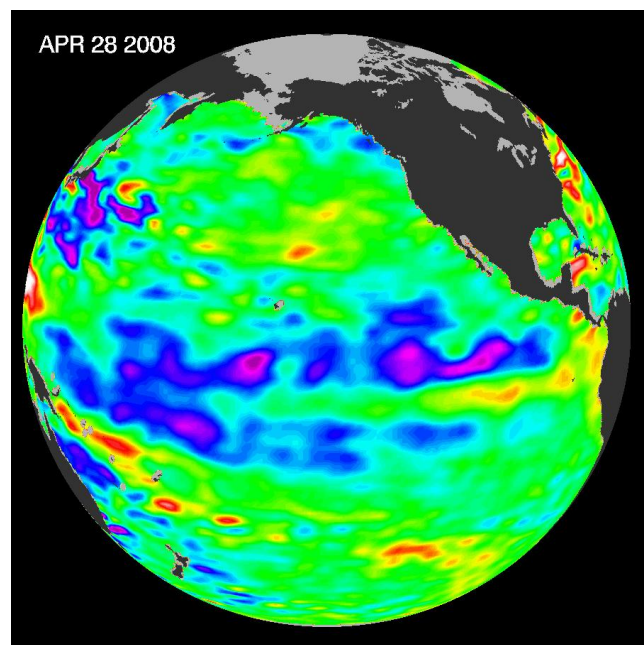


Lingering La Niña about to end; El Niño in sight, say ocean models

by Ed Berg



Satellite image of fading La Niña cool water in the tropical Pacific Ocean. Purple color represents the coolest water, about 5°F below average. Green color is average temperature, and red color is 5°F above average. Temperatures represent departures from seasonal averages, and are computed over a 10 day period centered on April 28th. Ocean models predict that the cool water (purple) will be replaced by El Niño warm water (red) water later this summer. (Image from US-French Jason satellite, Jet Propulsion Laboratory, University of California)

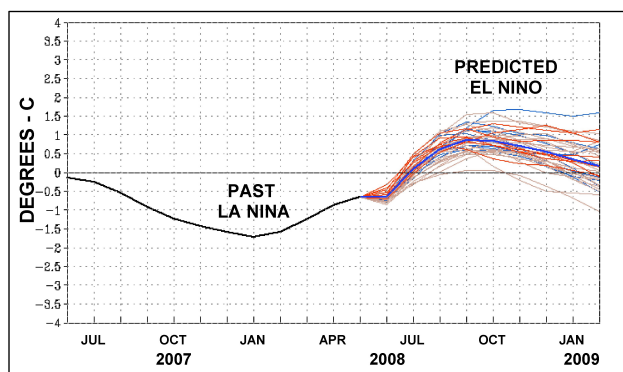
It has been a long winter and a late spring in Alaska. We've had some sunny days on the Kenai but nighttime temperatures can still dip close to the frost line. Basically, we are coming off a 10-month La Niña and a classic La Niña winter. It appears that now however the tide is turning and a warm El Niño may be on the way.

The El Niño – La Niña cycle originates down in the equatorial Pacific Ocean, and in one way or another it affects the whole Pacific basin including Alaska.

The trouble began early in January 2007 when a pool of cool water began to develop in the eastern tropical Pacific, off the coast of South America. The easterly tradewinds intensified and spread the cool water westward, as a giant blue tongue along the Equator, as represented on satellite images. The cool blue tongue expanded westward toward Australia, peaking in January of this year. By February warm water began to appear along the coast of South America and is now expanding westward, heating up the La Niña tongue from behind.

In the next few months the equatorial Pacific will enter a “neutral” condition, according to ocean temperature models, but towards fall the warm water could develop into a red El Niño tongue of even warmer water that extends all the way from South America to Australia. Alternatively, the neutral condition could lapse back into another La Niña. Unfortunately the El Niño – La Niña models can only look confidently a few months ahead, at the present state of the art.

The La Niña tongue of cool water in the equatorial Pacific affects wind patterns in complex ways that ultimately bring cold weather to Alaska and increased storms to the central US such as we saw last winter. The El Niño – La Niña cycle or “El Niño – Southern Oscillation” (ENSO), as it is known to meteorologists, has a strong effect on Kenai weather. At the 1999 bottom of the last La Niña (1998-2000), Kenai airport annual temperatures were down about 2° F and precipitation was about four inches (18%) above average. Generally, Kenai and Homer annual temperatures correlate with standard ENSO indices at about the 60% level, where 100% would be perfect agreement. This correlation indicates that although the ENSO cycle does have a fairly strong effect on our temperatures, there are other important factors, such as the position of the jet stream, the strength of the wintertime Aleutian Low, and the periodic blasts of cold air that we get from the arctic.



A series of ocean temperature models predict continued warming of the equatorial Pacific Ocean and the onset of an El Niño by late summer. Officially, an El Niño occurs when the ocean temperature is more than 0.5° C above average, and La Niña occurs when ocean temperature is more than 0.5° C below average, in the Niño 3.4 zone along the Equator. If the models are correct, we should have a warm winter in Alaska. (Graphic modified by author from NASA website)

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The present La Niña is still quite visible in the satellite image of the sea surface temperatures in the Pacific basin. The purple color is the coolest water, about 5° F below average. The green is average seasonal temperature, and the red is 5° F above average. The satellite uses a high-precision microwave altimeter to

measure the height of the sea surface (to within two inches) and then calculates the sea surface temperature. The warmest water in this picture stands about 13 inches higher than the coolest water, due to thermal expansion of the water column. These pictures can be viewed every two weeks back to 1992 at <http://topex-www.jpl.nasa.gov/science/jason1-quick-look/>.

There are a number of ocean temperature models that try to predict the ebb and flow of El Niños and La Niñas. They are based on slightly different assumptions, and their predictions can diverge substantially looking forward many months, as shown in the graph. For the next several months, however, they all forecast at least short-term warming. These forecasts are for a narrow band along the Equator west of South America, called Niño 3.4, which is the birthplace of El Niño and La Niña.

Most of the forecasted temperatures exceed the 0.5° C threshold for an El Niño, but several of the more conservative models forecast a only a half-hearted warming and then a return to La Niña by November. Skeptics might rightly complain this sounds all too much like stock market forecasting! Anyway, place your bets, and check out the NOAA website from time to time to see how this story unfolds. It could mean a warmer fall and winter with lots of snow for good skiing and snowmachining, unless the weather dice take a different roll.

The NOAA El Niño website is at http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/.

Ed Berg has been the ecologist at the Kenai National Wildlife Refuge since 1993. He teaches several courses at the Kenai Peninsula College on themes of this Guide, the next course being "Cycles of Nature" in September. Previous Refuge Previous Refuge Notebook columns can be viewed on the Web at <http://www.fws.gov/refuge/kenai/>.